

CHAIRMAN'S CORNER

ENGINEERS AS SCIENTISTS

Each licensed professional engineer has an undergraduate degree as a Bachelor of Science. Note it is a Bachelor of Science degree in a specific engineering discipline. Therefore, each professional engineer is not only an engineer, but is also a scientist.

Warren G. Hahn, PE
FBPE Chair

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Engineers are more than scientists, in that engineers don't just analyze and calculate. They go one step further to design and build "stuff." They make "stuff" work. They make "stuff" safe. Engineers provide for the health, safety and welfare of the general public.

If the general public were to view small villages, towns, medium-sized cities, or a megalopolis from a drone surveillance camera system, they would not only realize the importance of engineers in the design, fabrication and manufacture of drone camera systems, but the importance of engineers in virtually every road, park, building, structure, bridge and all of the components hidden therein, where "stuff" is designed and contrived by professional engineers in the interest of the health, safety and welfare of the general public.

Who could be better scientists than engineers? Engineers, by the very nature of the discipline in which we work, analyze theories and propositions based on facts! After this, engineers have to make the "stuff" that they engineer and design operate properly and efficiently.

Engineers work with facts. Their computerized models, whether they be for an energy savings evaluation of a building automation system, a type of girder used in the construction of a river crossing bridge, the electrical fault calculation of switch gear protecting a power system or the capability of a fire protection system to douse a fire within a warehouse or office, are all based upon facts, not suppositions. As such, isn't it the professional engineer's responsibility to "weigh-in" on the scientific facts that might affect the health, safety and welfare of the general public?

One of the areas where professional engineers may have this responsibility is to "weigh-in" on the scientific facts concerning climate change.

Let's look at some facts versus previous assumptions of computerized climate change models. **GRAPH 1** depicts 73 different climate change models based upon various assumptions starting in 1979, progressing through 2025. The thick

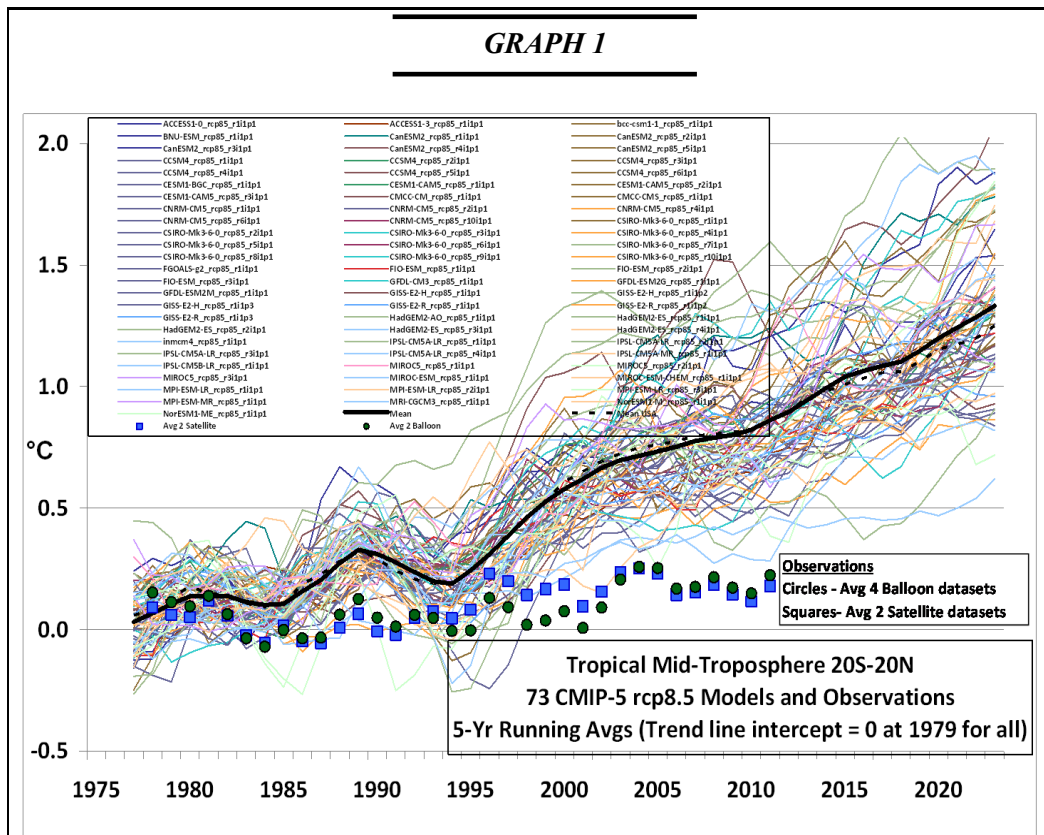


Image Source: Christy, John, R, Distinguished Professor, Department of Atmospheric Science, Director Earth System Science Center, The University of Alabama in Huntsville. *Tropical Mid-Troposphere 20S-20N (Graph)*. Retrieved from <http://www.climatedialogue.org/the-missing-tropical-hot-spot/>.

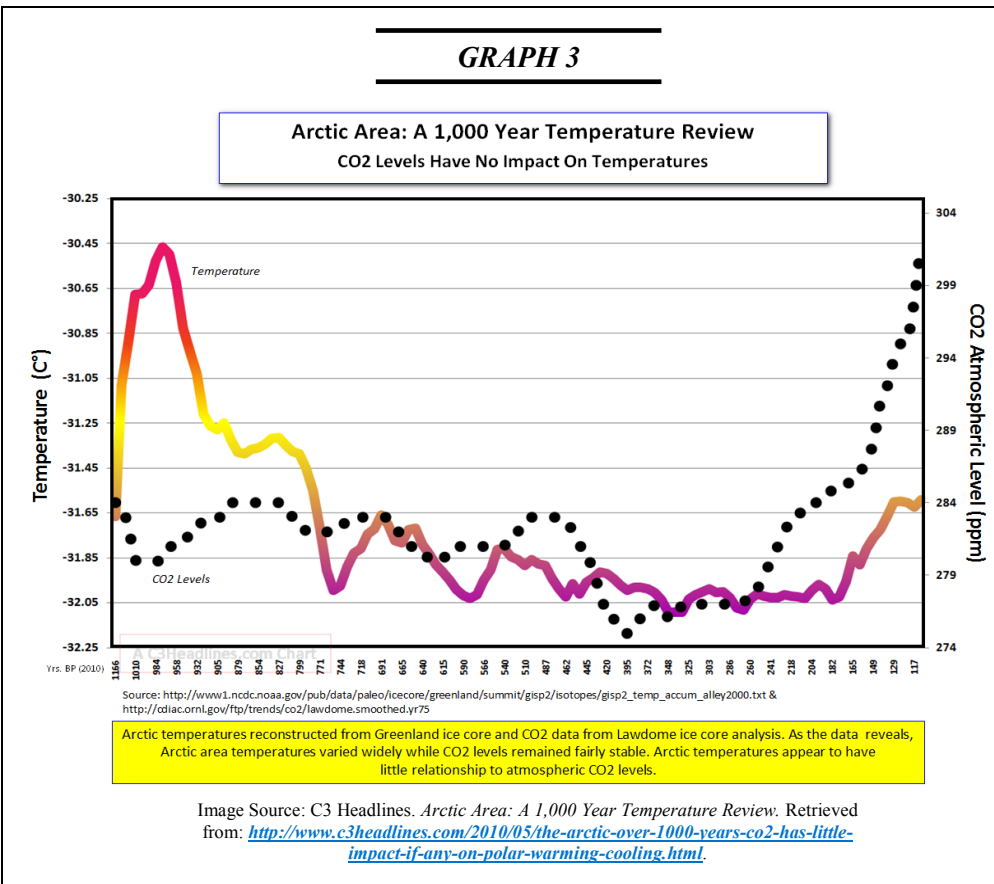
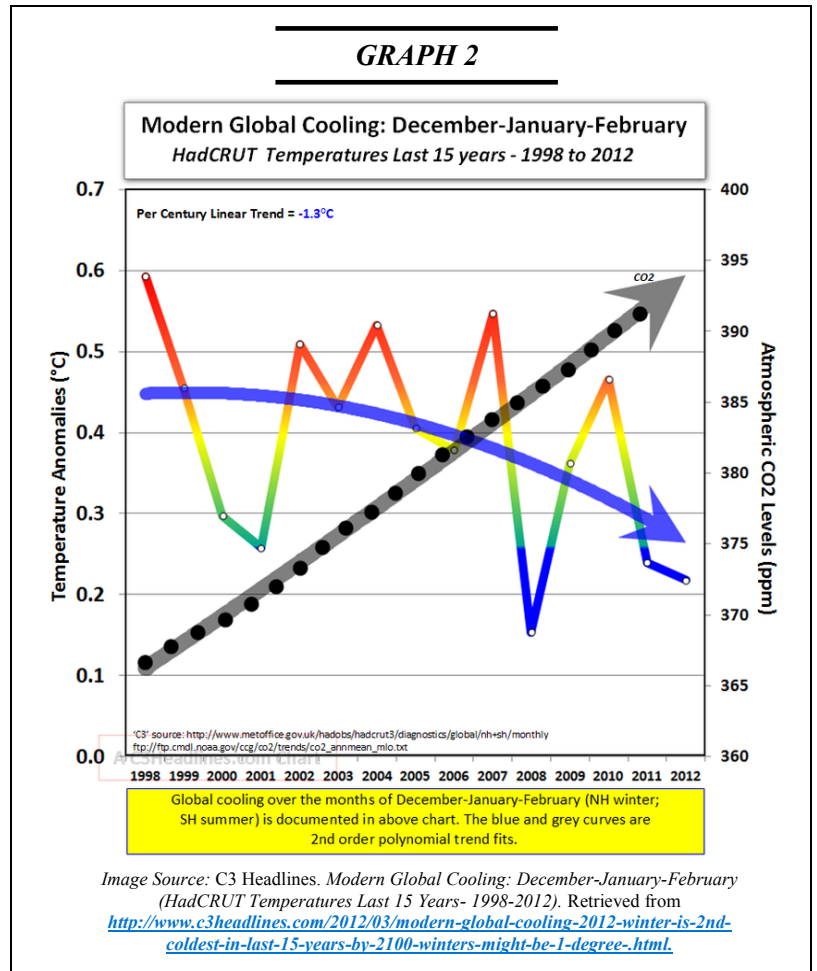
black line represents the average projection of the 73 models. Note that virtually every model is running much warmer than the actual temperatures recorded (blue and green circles & squares) through 2012. Many of the predicted temperature models had the temperature rising 1.5°C by 2012! The measured Mid-Troposphere 5-year running temperature has increased approximately 2/10 of 1° C from 1979 through 2012.

GRAPH 2 illustrates the temperatures recorded during the months of December, January and February over a 15-year period with the blue and gray arrows showing that the second order polynomial trend compared with the carbon dioxide concentration rising, yet with winter temperatures dropping.

And **GRAPH 3** shows arctic temperatures from a Greenland ice core with the temperatures having virtually no relationship to the content of CO² measured in the ice core.

Other assumptions projected that from 1979 through the present sea water levels would rise. However, one of our own FBPE members has researched the Atlantic Ocean water levels in his county and found that there was a very slight increase annually between 1979 through the present.

It would seem that the assumptions for the climate models and predictions used in these three instances were just that, "assumptions," and not necessarily based on facts. However, it cannot be denied that one of the graphs indicate a slight temperature rise of 2/10 of 1°C. This may cause concern that the CO² developed from fossil fuel plants might be the cause.



This is all the more reason that engineers as scientists should look at the facts and make decisions and recommendations as scientists as to what future steps, if any, we as engineers would recommend to our society.

For instance, photovoltaic, solar, wind, tide movement and similar energy sources, once constructed, provide "free" energy and certainly would seem to be a reasonable approach for our future energy use. However, if the above systems cost two to four times more than fossil fuel or nuclear energy plants in terms of megawatts produced and/or cost per kilowatt hour, and it is determined by the scientific method that engineers employ that CO² in the atmosphere really has no effect on climate, then the rush to build such costly plants may not be the answer. Rather, the slight temperature rise recorded of 0.2°C over the past 33 years may just be a natural periodic occurrence caused by sun activity.

Certainly the prospect of keeping our atmosphere as clean as possible, with sun, wind, and tide energy plants are amiable goals. But, if with reasonable certainty this can be achieved through nuclear, coal, natural gas and/or oil energy plants, at a lower megawatt construction cost and lower KWH cost, wouldn't this be the best course?

As indicated in the Chairman's Corner article in the March 2014 edition of FBPE's *Connection* newsletter, world energy demand will increase and double by 2050. If we are to provide this energy by mostly sun, wind and tide energy plants at double or more the cost of nuclear, coal, gas, and oil (and CO² is not considered a pollutant) isn't it to the betterment for the welfare of the public to provide this energy in the least costly manner? At the same time, the fossil fuel energy plants must operate with the cleanest air possible. This then, would be the best possible solution.

On the other hand, if CO² is proven to contribute to climate change, then perhaps wind, sun and tide energy plants are our best recourse. Still, we must recognize the fact that these are much slower in development, most likely much more costly and are less likely able to satisfy the energy demands of less developed countries.

In either case, professional engineers (who are the most proficient in providing for the health, safety and welfare of the public) should also then accept the burden of examining climate change facts and then come to a scientific engineering conclusion based upon these facts.

Engineers as scientists can accomplish a climate change analysis better than any other profession.

Warren G. Hahn, PE is a licensed engineer with Hahn Engineering, Inc. located in Tampa, Florida. He has over 50 years experience in engineering contracting and construction. Mr. Hahn's experience includes extensive involvement in heating, ventilating and air conditioning (HVAC) systems. He provides engineering, design, analysis, construction supervision and inspection of mechanical, plumbing, fire sprinkler, security, network, lighting and electrical systems. Mr. Hahn also serves as an expert witness with forensic experience related to mechanical and electrical engineering.

Mr. Hahn is currently serving his second term as Chair of the Florida Board of Professional Engineers.

FBPE Disclaimer

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Mark Your Calendar!

June 2014

- 7-12** 62nd Annual BOAF Conference
- 11-12** FEMC & FBPE Board Meetings

July 2014

- 4** FBPE Offices Closed-Independence Day
- 11** FEMC Board Ops Conference Call
- 15** Application Review & PCP Meeting
- 16** Rules Committee Meeting
- 25** Ratification Conference Call

August 2014

- 6-7** FBPE Board Meeting
- 6-9** FES/FICE 98th Annual Summer Conference & Expo
- 20-23** NCEES Annual Meeting
- 26** FEMC Board Conference Call

September 2014

- 1** FBPE Offices Closed-Labor Day
- 5** FEMC Board Ops Conference Call
- 16** Application Review & PCP Meeting
- 16** FAMU/FSU Fall 2014 Engineering Day
- 26** Ratification Conference Call

Board meetings and other scheduled activities can also be found on our calendar located on the Home page of www.fbpe.org.